

Listing of Claims

This listing of claims replaces all prior versions and listings of claims in the application:

1. (original) A method of modifying development of a plant comprising transforming a plant cell with a nucleic acid encoding a plant cyclin-dependent kinase inhibitor polypeptide to produce a transformed plant cell; and, growing the transformed plant cell or progeny of the transformed plant cell to produce a transformed plant under conditions wherein the plant cyclin-dependent kinase inhibitor polypeptide is expressed in a proliferative tissue of the transformed plant to inhibit development of a differentiated tissue in the plant.
2. (previously presented) The method of claim 1, wherein the nucleic acid encoding the cyclin-dependent kinase inhibitor is homologous to ICK1.
3. (previously presented) The method of claim 1, wherein the nucleic acid encoding the cyclin-dependent kinase inhibitor is ICK1.
4. (previously presented) The method of claim 1, wherein the cyclin-dependent kinase inhibitor polypeptide is at least 70% identical, when optimally aligned, to ICK1.
5. (previously presented) The method of claim 1, wherein the cyclin-dependent kinase inhibitor polypeptide is ICK1.
6. (original) The method of claim 1, wherein the plant is a member of the *Cruciferae* family.
7. (original) The method of claim 1, wherein the plant is a member of the *Brassica* genus.

8. (original) The method of claim 1, wherein the nucleic acid encoding the cyclin-dependent kinase inhibitor polypeptide is operably linked to a constitutive promoter.
9. (original) The method of claim 1, wherein the nucleic acid encoding the cyclin-dependent kinase inhibitor polypeptide is operably linked to a tissue-specific promoter.
10. (cancelled).
11. (original) The method of claim 9, wherein the tissue-specific promoter is the AP3 promoter.
12. (original) The method of claim 9, wherein the tissue-specific promoter mediates expression of the nucleic acid encoding the cyclin-dependent kinase inhibitor polypeptide in petal or stamen primordia.
13. (previously presented) The method of claim 1 wherein modifying development of the plant makes the plant male sterile.
14. (original) The method of claim 1 wherein the development of the tissue in the plant is modified so that petals on the transformed plant are altered or absent.
15. (previously presented) A transgenic plant comprising an expressible heterologous nucleic acid encoding a cyclin-dependent kinase inhibitor polypeptide capable of inhibiting a cyclin-dependent kinase.
16. & 17. (cancelled)
18. (original) A transgenic plant having a recombinant genome comprising a heterologous nucleic acid encoding a cyclin-dependent kinase inhibitor that is expressed in a proliferative tissue of the transformed plant to inhibit development of a differentiated tissue in the plant.

19. (cancelled)

20. (previously presented) A transgenic plant tissue obtained from the transgenic plant of claim 18.

21. (original) The plant tissue of claim 20 wherein the tissue is selected from the group consisting of a seed and a flower.

22. (original) A method of growing the transgenic plant of claim 18, comprising growing the plant under conditions so that the cyclin-dependent kinase inhibitor polypeptide is expressed in a proliferative tissue of the transformed plant to inhibit development of a differentiated tissue in the plant.

23. through 26. (cancelled)

27. (original) A method of modifying development of a plant comprising transforming a plant cell with a nucleic acid encoding a plant cyclin-dependent kinase inhibitor polypeptide to produce a transformed plant cell; and, growing the transformed plant cell or progeny of the transformed plant cell to produce a transformed plant under conditions wherein the plant cyclin-dependent kinase inhibitor polypeptide is expressed in a proliferative tissue of the transformed plant to change the ploidy of a differentiated tissue in the plant.

28. (previously presented) The method of claim 1, wherein the nucleic acid encoding the cyclin-dependent kinase inhibitor comprises:

- a nucleic acid sequence as set forth in SEQ ID NO: 1;
- a nucleic acid sequence as set forth in SEQ ID NO: 3; or
- a nucleic acid sequence having at least 95% sequence identity with a nucleic acid sequence set forth in SEQ ID NO: 1 or SEQ ID NO: 3.

29. (previously presented) The method of claim 1, wherein the nucleic acid encoding the cyclin-dependent kinase inhibitor comprises a nucleic acid sequence as set forth in SEQ ID NO: 1 or 3.

30. (previously presented) A method of modifying floral development of a plant, comprising
transforming a plant cell with a nucleic acid encoding an *Arabidopsis* cyclin-dependent kinase inhibitor polypeptide to produce a transformed plant cell; and
growing the transformed plant cell or progeny of the transformed plant cell to produce a transformed plant,
wherein the plant cyclin-dependent kinase inhibitor polypeptide is expressed in petal or stamen primordia of the transformed plant to inhibit floral development.

31. (previously presented) The method of claim 30, wherein the *Arabidopsis* cyclin-dependent kinase inhibitor polypeptide is encoded by a nucleic acid comprising:
a nucleic acid sequence as set forth in SEQ ID NO: 1;
a nucleic acid sequence as set forth in SEQ ID NO: 3; or
a nucleic acid sequence having at least 95% sequence identity with a nucleic acid sequence set forth in SEQ ID NO: 1 or SEQ ID NO: 3.

32. (previously presented) A method of modifying development of a plant, comprising:
transforming a plant cell with a nucleic acid encoding an *Arabidopsis* cyclin-dependent kinase inhibitor polypeptide to produce a transformed plant cell; and
growing the transformed plant cell or progeny of the transformed plant cell to produce a transformed plant,
wherein expression of the plant cyclin-dependent kinase inhibitor polypeptide decreases ploidy of a differentiated tissue in the plant.

33. (previously presented) The method of claim 32, wherein the *Arabidopsis* cyclin-dependent kinase inhibitor polypeptide is encoded by a nucleic acid comprising:

a nucleic acid sequence as set forth in SEQ ID NO: 1;
a nucleic acid sequence as set forth in SEQ ID NO: 3; or
a nucleic acid sequence having at least 95% sequence identity with a nucleic acid sequence set forth in SEQ ID NO: 1 or SEQ ID NO: 3.

34. (new) The method claim 1, wherein:
the plant cyclin-dependent kinase inhibitor polypeptide comprises a C-terminal region having at least 95% identity when optimally aligned, with gaps, insertions or deletions of up to 3 amino acids, with consensus sequence:

$X_1X_2X_3X_4X_5X_6X_7KYNX_8DX_9X_{10}X_{11}X_{12}X_{13}PLX_{14}GRYX_{15}WVX_{16}X_{17}X_{18}$

wherein:

X_1 is L, K or Q;

X_2 is K, R, Q, E, N, K or R;

X_3 is K, Q or L;

X_4 is F or L;

X_5 is K, L, I, T or M;

X_6 is E or K;

X_7 is F or Y;

X_8 is I or F;

X_9 is V or E;

X_{10} is N or K;

X_{11} is D or E;

X_{12} is K, E, T or I;

X_{13} is E, G or S;

X_{14} is E, K or Q;

X_{15} is K, S or Q;

X_{16} is K, S or Q;

X_{17} is L or V; and

X_{18} is E, N, D or K; and,

and wherein (a) the plant cyclin-dependent kinase inhibitor polypeptide is expressed in petal and/or stamen primordia of the transformed plant, and the modified development of the

plant comprises inhibition of floral development; or (b) the plant cyclin-dependent kinase inhibitor polypeptide is expressed in leaf cells of the transformed plant, and the modified development of the plant comprises a decreases in ploidy.

35. (new) The transgenic plant of claim 15, wherein the expressible heterologous nucleic acid encodes a plant cyclin-dependent kinase inhibitor polypeptide capable of inhibiting a cyclin-dependent kinase.

36. (new) The transgenic plant of claim 18, wherein the heterologous nucleic acid encodes a plant cyclin-dependent kinase inhibitor that is expressed in a proliferative tissue of the transformed plant to inhibit development of a differentiated tissue in the plant.

37. (new) A method of modifying development of a plant comprising transforming a plant cell with a nucleic acid encoding a plant cyclin-dependent kinase inhibitor polypeptide to produce a transformed plant cell; and, growing the transformed plant cell or progeny of the transformed plant cell to produce a transformed plant under condition wherein the plant cyclin-dependent kinase inhibitor polypeptide is expressed in a proliferative tissue of the transformed plant to interact with a cyclin dependent kinase or a cyclin so as to inhibit development of a differentiated tissue in the plant, wherein the plant cyclin-dependent kinase inhibitor comprises a C-terminal region having at least 95% identity when optimally aligned, with gaps, insertions or deletions of up to 3 amino acids, with consensus sequence:

$X_1X_2X_3X_4X_5X_6X_7KYNX_8DX_9X_{10}X_{11}X_{12}X_{13}PLX_{14}GRYX_{15}WVX_{16}X_{17}X_{18}$

wherein:

X_1 is L, K or Q;

X_2 is K, R, Q, E, N, K or R;

X_3 is K, Q or L;

X_4 is F or L;

X_5 is K, L, I, T or M;

X_6 is E or K;

X_7 is F or Y;

X₈ is I or F;
X₉ is V or E;
X₁₀ is N or K;
X₁₁ is D or E;
X₁₂ is K, E, T or I;
X₁₃ is E, G or S;
X₁₄ is E, K or Q;
X₁₅ is K, S or Q;
X₁₆ is K, S or Q;
X₁₇ is L or V; and
X₁₈ is E, N, D or K.

38. (new) The method of claim 37, wherein the cyclin-dependent kinase inhibitor polypeptide is expressed in a proliferative tissue of the transformed plant to interact with Cdc2a or CycD3 so as to inhibit development of the differentiated tissue.

39. (new) The method of claim 37, wherein the consensus sequence has the sequence LKEKFKKKYNFD FEKEKPLEGRYEWVKLE (positions 163-191 of ICK1).

40. (new) The method of claim 38, wherein the consensus sequence has the sequence LKEKFKKKYNFD FEKEKPLEGRYEWVKLE (positions 163-191 of ICK1).

41. (new) The method of claim 37, wherein the differentiated tissue is a floral tissue.

42. (new) The method of claim 38, wherein the differentiated tissue is a floral tissue.

43. (new) The method of claim 39, wherein the differentiated tissue is a floral tissue.

44. (new) The method of claim 40, wherein the differentiated tissue is a floral tissue.

45. (new) A method of modifying development of a plant, comprising:

transforming a plant cell with a nucleic acid encoding ICK1 to produce a transformed plant cell; and

growing the transformed plant cell or progeny of the transformed plant cell to produce a transformed plant,

wherein (a) the ICK1 is expressed in petal and/or stamen primordia of the transformed plant, and the modified development of the plant comprises inhibition of floral development; or (b) the ICK1 is expressed in leaf cells of the transformed plant, and the modified development of the plant comprises a decrease in ploidy.

46. (new) A method of affecting activity of Cdc2a or CycD3 so as to inhibit development of a differentiated tissue of a plant, comprising:

transforming a plant cell with a nucleic acid encoding a plant Cip/Kip cyclin-dependent kinase inhibitor polypeptide to produce a transformed plant cell; and

growing the transformed plant cell or progeny of the transformed plant cell to produce a transformed plant,

wherein (a) the plant Cip/Kip cyclin-dependent kinase inhibitor polypeptide affects activity of Cdc2a; or (b) the plant Cip/Kip cyclin-dependent kinase inhibitor polypeptide affects activity of CycD3.